MATH BLASTER Mystery™

math

Davidson & Associates, Inc.
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Torrance, CA 90505

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Davidson.
Teaching Tools From Teachers

QUICK START

Start the Program

Apple
- Insert program disk in drive 1 (label side up).
- Turn on computer.
- Follow the screen prompts.

IBM
- Boot DOS 2.1 or higher. (Tandy 2.11.24 or higher)
- Insert program disk in drive A (label side up).
- At the A>, type **MBM**
- Follow screen prompts.

Sign In

- Enter your name. Press **<Return>** or click **OK**.
- Use the mouse or the arrow keys and <Tab> to select the correct month, day, and year.
- Press **<Return>** or click **OK**.

Select a Level

Mouse
- Point to the Level menu to select a level of difficulty (1-4).

Keyboard
- Press **<Esc>** to access the menu bar.
- Use right arrow key to access Level menu and down arrow to select a level (1-4) **<Return>**.

Select an Activity

Mouse
- Click an activity icon on the Main screen.

Keyboard
- Use arrow keys to select an icon **<Return>**.

To stop an activity, select **Stop** from the Activity menu.
See Appendix C for hard disk installation steps.

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- Employee involvement is our way of life.
- Dealers and suppliers are our partners.
- Integrity cannot be compromised.

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WELCOME TO *MATH BLASTER MYSTERY*

Welcome! Put on your sleuth hat and grab your magnifying glass; you are about to become a detective and master the art of solving mysteries.

Math Blaster Mystery will provide you with a variety of intriguing activities to search for relevant clues, make inferences, draw conclusions, test your assumptions and solve the mystery. You'll soon discover that developing logical strategies to solve mathematical mysteries is challenging and exciting.

As you are promoted from Computation Cadet to Chief Problem Solver, you'll not only strengthen your math skills, but you will master effective problem-solving strategies as well.

About *Math Blaster Mystery*

Math Blaster Mystery was designed by teachers to help students develop higher order thinking skills and strategies for solving problems. It was tested in the classrooms of Fleming Junior High School in Lomita, California, where it was used in conjunction with other learning activities as an effective tool for addressing several math curriculum objectives.

It is particularly successful in meeting math curriculum objectives which involve application, analysis and synthesis. One of the reasons for its success is that *Math Blaster Mystery* is designed to not only provide students with opportunities for problem solving, but to help them develop strategies for solving problems as well. *Math Blaster Mystery* is a highly motivating, highly effective tool for learning in the classroom and in the home.

Registering Your Five-year Warranty

Davidson & Associates, Inc. provides a **5 year** warranty on *Math Blaster Mystery* and will replace, free of charge, any malfunctioning or damaged disk. Complete and return the enclosed registration card to register your warranty and receive information about updates and new programs.

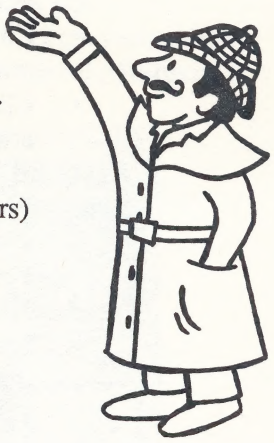
If your disk is defective or becomes damaged within the **5 year** period, send the **disk only** with a brief note explaining the problem. Be sure to include your name and address. (Enclose the product registration card at this time, if you have not yet returned it.)

Send these items to:

Davidson & Associates, Inc.
3135 Kashiwa Street
Torrance, CA 90505
Attention: Customer Support

STARTING *MATH BLASTER MYSTERY*

System Requirements



Apple IIe, IIc, IIc+, IIGS

- 128K, 1 or 2 disk drives
- extended 80 column card
- composite monitor for color
- printer, mouse (optional)

IBM/Tandy (and MS DOS computers)

- 256K, 1 or 2 disk drives
- CGA, VGA, MCGA, EGA, or Hercules display adapter
- DOS (IBM 2.1 or higher) (Tandy 2.11.22 or higher)
- printer, mouse (optional)

Starting the Program

Apple

- Insert program disk, label side up, in drive 1.
- Turn on computer and follow screen prompts.
- See Appendix B for Printer Setup directions.

IBM

- Start the computer with the DOS listed above.
- Put the program disk, label side up, in drive A. [If you have a VGA, MCGA, EGA or Herc card, at the A>, type **setup** and turn to page 36.]
- At the A>, type **MBM** and follow screen prompts.
- Select **Setup** from the File menu to specify printer and pathnames for data and records. If the program runs too fast on your computer, increase the delay number in the box to slow down the speed. (Try increments of 200 until desired speed is reached.)

On the opening screen, you will see a dialog box.

- Enter a name (up to 16 characters) **<Return>**.

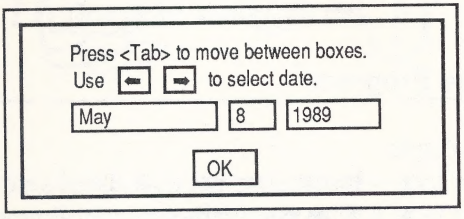
In the next dialog box, select the month, day, and year.

Mouse

- Click on the screen arrows until the correct month shows in the first box.
- Click on next box to move cursor, then click arrows to change the day.
- Click on next box to move cursor, then click arrows to select the year; click **OK**.

Keyboard

- Press keyboard arrows until the correct month shows in the first box.
- Press **<Tab>** to move the cursor to the next box. Use arrows to select the day.
- Press **<Tab>** to move to the next box and select the year in a similar manner; press **<Return>.**



Selecting a Level and an Activity

The Davidson Student Desktop Interface allows quick and easy movement from one part of the program to another. Students can use either a mouse or the keyboard to pull down a menu (notice the menu bar across the top of the Main screen on the next page) or select a learning activity (represented by a colorful box or icon).

Problems for each activity are separated into four levels of difficulty. Contents of each level are explained in more detail in the chapter for each activity.

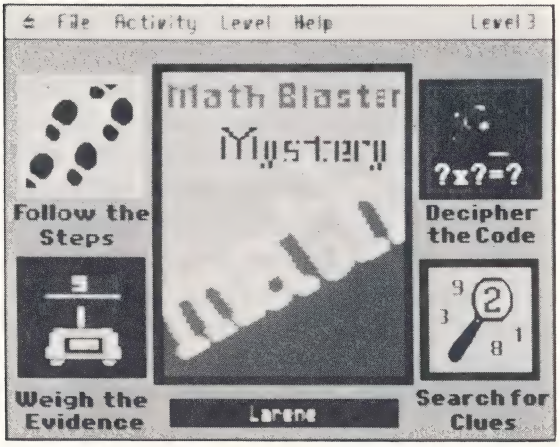
Pull down the Level menu and select a level.

Mouse

- Point to the word **Level** on the menu bar and hold down the mouse button.
- Drag the pointer to a level; release the button.

Keyboard

- Press **<Esc>** to access the menu bar.
- Use the right arrow key to select the menu, then the down arrow key to select a level **<Return>**.



Select an Activity icon using a mouse or the keyboard.

Mouse

- Click one of the four activity icons on the Main screen.

Keyboard

- Use arrow keys to highlight an icon **<Return>** or select **Start** from the Activity menu.

To stop an activity, press **<Apple>S** (Apple) or **<Ctrl>S** (IBM) or select **Stop** from the Activity menu.

Record Keeping

This feature makes it possible to save a student's score at the end of each activity and keep a cumulative record. Records may be printed or viewed on screen to help parents and teachers evaluate progress.

First, format a disk on which to save student records.

Apple

- Use ProDOS to format a floppy disk for storing record files. Name the disk, i.e., /RECORDS/

IBM

- Format a floppy disk using the correct version of DOS. (Make a subdirectory on the floppy disk only if you will be using 1 drive. At the A>, type **md a:records**) Directions for creating a subdirectory on a hard disk are on page 37.

Now you are ready to create a student record file:

- Select **Setup** from the File menu and type the complete pathname for records.
  Apple: the pathname is whatever you named your disk when you formatted it.
  IBM: designate a drive for records (b:) or the pathname on your hard disk (c:\mbm\records\) or the pathname for a single drive (a:\records\).
- Select **Record Keeping** from the File menu. A check indicates the feature is ON.
- Insert your Records disk.
- A box will appear for you to type in a filename for the record **<Return>**.

To view a student's record on the screen,

- Select **See Record** from the File menu.
- Insert the Records Disk.
- Select the name of the file from the list shown, and press **<Return>**.

To print out a student's cumulative record:

- Make sure that you have entered the printer and pathname information on the Setup screen.
- Select **Print Record** from the File menu.
- Insert the Records disk.
- Select the filename.
- Press **<Return>** to print or **<Esc>** to cancel.

Scoring

At the end of each activity, a scoreboard will appear displaying the score and including the detective status that the student has attained. Starting with the rank of Computation Cadet, as a student earns each 1000 points he or she will be promoted to Arithmetic Agent, then Digit Detective, Solution Sergeant, Calculation Captain, and finally, Chief Problem Solver.

In Follow the Steps, each step is worth 25 points; retries are worth 10. A student who skips steps but answers Step 4 correctly will receive the full 100 points.

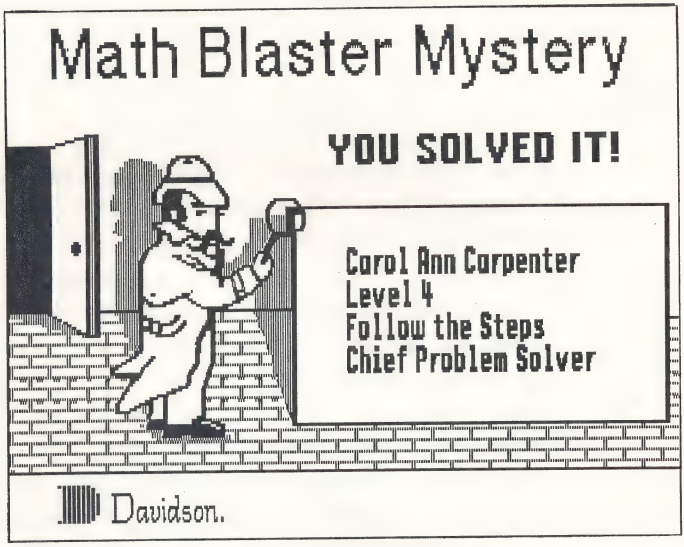
In Weigh the Evidence, the student begins each problem with 100 points; 10 points are subtracted for an incorrectly marked weight; 5 points are subtracted for each move beyond a predetermined minimum.

In Decipher the Code, the student begins with 100 points, and keeps them if the problem is solved in 3 tries or less. Ten points are subtracted for each additional try. The maximum number of tries allowed is 15.

In Search for Clues, the student begins with 100 points; 5 points are subtracted for each logical guess after the first one; 10 points are subtracted for each illogical guess.

Printing a Certificate

At the end of an activity, after the scoreboard appears, a graphic certificate may be printed. The certificate shows the student's name, the activity completed, and the student's current detective status.



Note to Apple users: refer to Appendix B for a list of printers, interfaces, and directions for printer setup. If your printer is not compatible with the graphics used in this special certificate, you may print a text certificate.

Note to IBM users: if you want to be able to print a graphic certificate, you must run **graphics** before starting the *Math Blaster Mystery* program.

- At the first A>, after booting the computer with DOS, type **graphics**.
- At the next A>, type **MBM** to start the program.

Be sure to select **Setup** from the File menu and specify the type of printer you are using.

The Pop-up Calculator

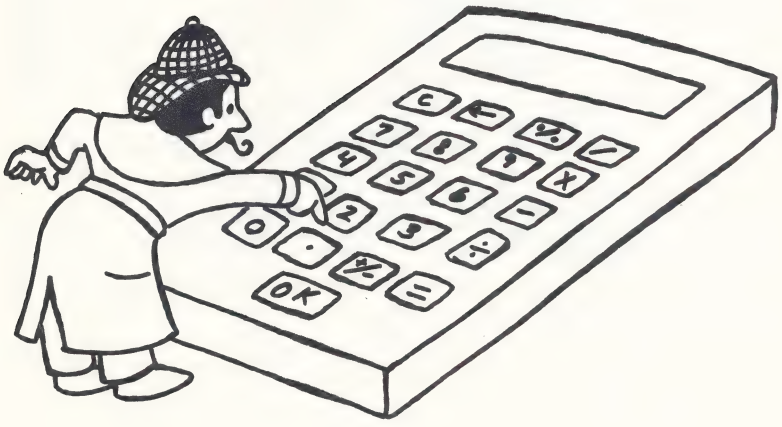
An on-screen, pop-up calculator is available to help with math calculations and may be accessed from the Help menu or the menu at the far left of the menu bar. Select **Calculator** from one of these menus or press:

<Apple> and = at the same time (Apple) or
<Ctrl> and **Z** at the same time (IBM).

To exit calculator, click **OK**, press **<Return>** or **<Esc>**.

The calculator feature may be deactivated when access is not desired. Press **C** while the message "Loading Program" is on the screen.

Note: The special +/- key allows you to toggle from positive to negative numbers. To change the sign, click the +/- key after you have entered the number. (On the keyboard, press **<Apple>** and the **-** key at the same time or **<Ctrl>** and **-** at the same time.)



Options

Sound and Graphic reinforcements may be toggled off and on. Select **Graphics** or **Sound** from the Activity menu. A check in front of the word signifies that the feature is ON.

You may use accelerator keys to go directly to some menu items, bypassing the menu bar. Notice the letters following many of the menu items. To use this short cut, press:

<Apple> and the letter at the same time (Apple) or **<Ctrl>** and the letter at the same time (IBM). For example, **<Apple> E** is a quick way to access the *Math Blaster Mystery* Editor.

ACTIVITY 1: FOLLOW THE STEPS

Purpose and Scope

Word problems challenge students to use mathematics to solve the kinds of problems they are likely to encounter in everyday situations. Follow the Steps teaches students a four-step process for solving word problems which breaks the problem into small workable parts.

Students will learn to:

- focus on what the problem is asking them to find
- identify the relevant information and disregard any unnecessary information
- formulate a mathematical equation
- find the solution.

Each level contains 25 problems using a variety of mathematical operations and methods of solution.

Level 1 contains problems with one and two steps using:

- addition, subtraction, multiplication and division with whole numbers
- addition and subtraction with proper and improper fractions and mixed numerals.

Level 2 contains problems with one and two steps using:

- all four operations with whole numbers
- all four operations with fractions
- all four operations with decimals.

Level 3 contains problems with two steps involving:

- all four operations using fractions
- all four operations using decimals
- percentages
- ratio and proportion.

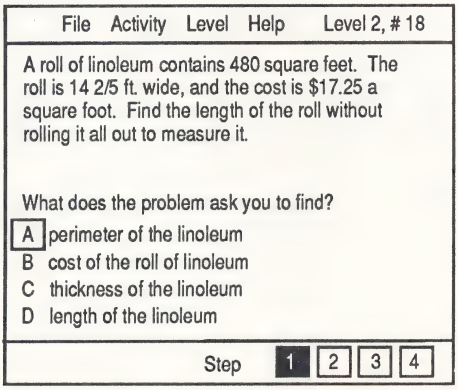
Level 4 has problems with two and three steps using:

- percentages, decimals, and fractions used in combination
- simple interest
- compound interest
- probability
- equations with variables.

Step One - What does the problem ask you to find?

This step requires you to focus on what the problem is asking you to find.

- Read the problem carefully, then select your answer from the choices below.


File Activity Level Help Level 2, # 18
A roll of linoleum contains 480 square feet. The roll is 14 2/5 ft. wide, and the cost is $17.25 a square foot. Find the length of the roll without rolling it all out to measure it.
What does the problem ask you to find?
A perimeter of the linoleum
B cost of the roll of linoleum
C thickness of the linoleum
D length of the linoleum
Step 1 2 3 4

Press **<Return>** and the correct answer to this step will be highlighted in the problem. Highlighting also appears and functions as a hint if you miss Step 1. Press any key to continue to the next step.

Step Two - What information is needed to solve the problem?

Now, identify all the facts needed to solve the problem.

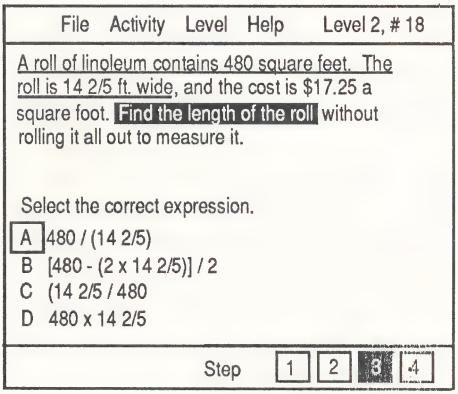
- Use arrows to select; to mark each choice, press **<Space>**. (More than one fact is usually needed to solve the problem.)
- When all necessary facts have been marked, press **<Return>**.

The necessary facts will be underlined in the problem. Press any key to continue to Step 3.

Step Three - Find the correct expression.

Now, find an expression which will solve the problem.

- Select the correct expression **<Return>**. Press any key to continue to Step 4.


File Activity Level Help Level 2, # 18
A roll of linoleum contains 480 square feet. The roll is 14 2/5 ft. wide, and the cost is $17.25 a square foot. Find the length of the roll without rolling it all out to measure it.
Select the correct expression.
A 480 / (14 2/5)
B [480 - (2 x 14 2/5)] / 2
C (14 2/5 / 480
D 480 x 14 2/5
Step 1 2 3 4

Step Four - Find the correct solution.

Now you are ready to calculate the answer. You may wish to select **Calculator** from the Help menu to help you with the calculation. Be sure to reduce any fraction to lowest terms.

- Select the correct answer and press **<Return>**.

At any time when you are working on a word problem, you may move forward to the next step or backward to review a step. As you become more proficient in solving word problems, you may want to skip a step or go directly to Step 4. (However, you'll not get the benefit of the highlighting or underlining if you skip Steps 1 & 2.)

- Click a numbered box at the lower right of the screen or type the number of the step you want.

Help

The Help menu offers you a choice of many features.

- Select **Instructions** to review the directions that were shown on the screen when you began the activity.
- Select **Definitions** to see a list of meanings for the math vocabulary used in the word problems.
- Select **Formulas** to review math formulas you may need to use in solving the word problems.
- Select **Calculator** if you need help with your calculations.

The Editor: Entering New Word Problems

Use the *Math Blaster Mystery* Editor to enter your own word problems to use with Follow the Steps. First, format a blank disk on which to save your new data file.

Apple

- Use ProDOS to format a blank disk; Give the disk (volume) a name, i.e., /NEWDATA/ or /MYDATA/.

IBM

- Format a floppy disk using the correct DOS. Create a subdirectory only if you will be using a single drive. (At the A>, type **md a:newdata)**
- To store data on a hard disk, see page 37.

Start the *Math Blaster Mystery* program. When the Main screen appears, select **Setup** from the File menu. <Tab> to the correct box and indicate the pathname for custom data. Select **Save** to save the defaults to the disk; select **Use** to change the defaults temporarily.

Apple

- In the box which asks for the data pathname, type in /MYDATA/ (or whatever you named your newly formatted disk).
- Select **Use** or **Save** and press **<Return>**.

IBM

- In the box which asks for the data pathname, indicate the drive in which you will put your data disk (b:). If you have created a subdirectory on the floppy or the hard disk, type in the complete pathname (a:\mydata\ or c:\mbm\mydata\).
- Select **Use** or **Save** and press **<Return>**.

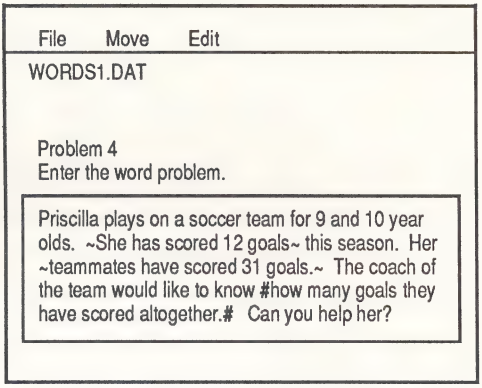
Now you are ready to access the Editor.

- Select **Editor** from the Main screen's File menu.
- When the blank Editor screen appears, insert your formatted disk.
- Select **New** from the Editor's File menu.
- A box will appear showing the pathname which you entered in **Setup.** Type in a name for your file (i.e., WDPROBS1, WDPROBS2) then click **Open** or press **<Return>**.

The next screen that appears will contain a box into which you'll type your first problem (maximum = 6 lines).

- Type the word problem in the box provided.
- Type a pound sign (#) before and after the phrase that tells what the problem asks the student to find. This is the phrase that will be highlighted after the student answers Step 1.
- Type a tilde (~) before and after each fact needed to solve the problem. These phrases will be underlined after the student answers Step 2.

Here is a sample screen showing how these marks will look when they are placed in the problem. Notice that only the needed facts are marked. (Make sure that the problem contains some **unneeded** facts that will challenge students to select only the relevant information.)


File Move Edit
WORDS1.DAT
Problem 4
Enter the word problem.
Priscilla plays on a soccer team for 9 and 10 year olds. ~She has scored 12 goals~ this season. Her ~teammates have scored 31 goals.~ The coach of the team would like to know #how many goals they have scored altogether.# Can you help her?

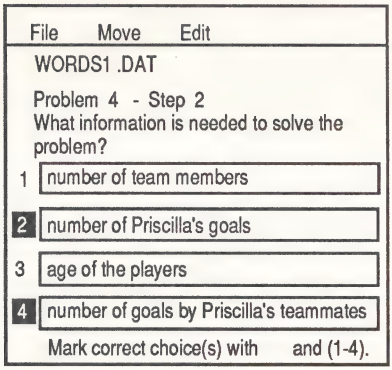
- Select **Preview Problem** from the Move menu to see how it will look on the screen with the highlighting and underlining. Go back and make any corrections necessary before going to the next step.
- Select **Next Step** from the Move menu to enter the information for Step 1.

The question asked in Step 1 is "What does the problem ask you to find?"

- Enter the correct answer and three distractors (incorrect answers) in the boxes provided, pressing **<Return>** after each entry.
- Mark the number of the correct answer choice.
  Apple: press **<Apple>** and the correct number.
  IBM: press **<Ctrl>** and an **F** key (1-4).
  The box around that number will darken.
  (To unmark, use the same key combinations.)
- Select **Next Step** from the Move menu.

The question asked in Step 2 is "What information is needed to solve the problem?"

- Enter each piece of needed information. Use as many boxes as you need.
- Fill any remaining boxes with distractors.
- Identify **all** correct answer choices by marking them as you did in Step 1.


File Move Edit
WORDS1 .DAT
Problem 4 - Step 2
What information is needed to solve the problem?
1 number of team members
2 number of Priscilla's goals
3 age of the players
4 number of goals by Priscilla's teammates
Mark correct choice(s) with and (1-4).

- Select **Next Step** from the Move menu.

Step 3 asks the student to "Select the correct expression."

- Enter the correct expression and three distractors in the boxes provided.
- Identify the correct answer choice by marking its number as you did in previous steps.
- Select **Next Step** from the Move menu.

Step 4 asks the student to "Select the correct solution."

- Enter the correct solution and three distractors.
- Identify the correct answer choice as before.
- Select **Add** from the Edit menu to type in your next problem; problems are automatically saved to your disk as you enter them. The maximum file size is 100 problems.
- Select **Close** from the File menu.
- Select **MBM** to return to the program.

Using Your New File with Follow the Steps

To use your new word problems with Follow the Steps.

- Select **Setup** from the File menu and designate the correct data pathname. Be sure data disk is in drive.
- Select **Your Data** from the Level menu.

A box will appear listing all the files on your data disk.

- Select the name of your file and click Open or press **<Return>**.
- Select the Follow the Steps icon **<Return>**.

Printing Word Problems or a Test

You may print out problems in three different formats.

- Make sure **Setup** information is correct.
- Access the Editor; then insert the disk which contains the data file you wish to print.
- Select **Open** from the File menu.
- Select the name of the file and click Open or press **<Return>**.

The file will be loaded into the computer's memory. Printing will begin with the problem on the screen and continue to the end of the file. (If you wish to start from a certain problem, select **Go To** from the Move menu and indicate the problem number.)

- Select **Print** from the File menu to print the file as it was entered into the Editor, with all steps and with correct answer choices indicated.
- Select **Print Problem** to print problems only, without the four steps.
- Select **Print Test** to print problems with their steps, but without any correct answer choices marked.

Level 1 Test

Problem 1

Larry has been collecting baseball cards for 2 years. His favorite team is the Chicago Cubs. Out of his 145 cards, 38 are of players on the Cubs. How many cards does he have of players from the other 25 major league teams?

What does the problem ask you to find?

A) number of cards he has of players who aren't Cubs
B) number of cards he has of players who are Cubs
C) amount of cards he collects each year
D) number of major league teams that exist

What information is needed to solve the problem?

A) number of total cards
B) number of years
C) number of Cubs cards
D) number of major league teams

Select the correct expression.

A) 145 - (38 + 25)
B) 145 - 38
C) 145 + 38
D) 38 - 145

Select the correct solution.

A) 103 cards
B) 117 cards
C) 107 cards
D) 113 cards

Teacher Tips

In Follow the Steps, students are guided through each problem using a logical step-by-step approach which builds problem-solving skills. Feedback is provided after each step.

If your students lack experience using a step-by-step approach, it will be helpful to focus on this new process before they attempt the problems. List the steps on the chalkboard and discuss each one. Then, put a sample problem on the board and do each step with your students before they use the program.

To save time, customize one of our data files, changing names and numbers, instead of making up new problems. Use a DOS command or a disk utility to copy one of our data files (WORDS1.DAT, WORDS2.DAT, WORDS3.DAT, and WORDS 4.DAT which will be found in a subdirectory called DATA) onto the disk that you prepared for custom data. (See your computer's manual for directions on how to copy a file and rename it.) Once it is copied onto your custom data disk, you can access it through the Editor. Edit the file; now you have new problems to print out or use with the program.

If students need extra practice on a particular step, print out some problems and have students practice underlining only the question in each problem, or have them underline necessary facts and cross out the unneeded information in each problem.

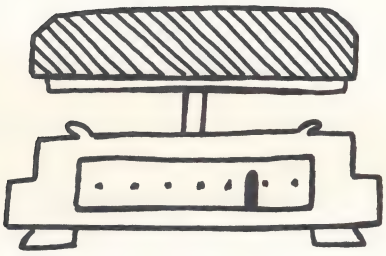
Review key words such as altogether, difference, and total. Then, have them find and circle key words in each printed problem. This will help them identify which operation to use.

Check reading comprehension as well as mathematical understanding by asking students to restate problems in their own words and write them down. (This is a meaningful language arts activity as well.)

Students can work collaboratively (in pairs or groups) to solve problems. They might also use the Editor to compose new problems for the class to solve. Specify another subject area (history, science, music) as a source for ideas for the new problems.

After students have mastered this step-by-step approach, have them solve word problems without the prompting. To do so, they would read the problem, solve it, and go directly to Step 4 to enter their answer.

ACTIVITY 2: WEIGH THE EVIDENCE



Purpose and Scope

Weigh the Evidence challenges and entertains students as they develop strategies to move a set of weights from one scale to another. The student must determine which three of four numbered weights total a given target number, then move and stack the three correct weights on another scale, in order, with the largest number on the bottom.

The student will learn to:

- break a problem into smaller parts
- think ahead and plan an effective strategy
- consider alternative solutions
- recognize and predict patterns in spatial relationships.

At each level, an unlimited number of problems will be randomly generated.

Level 1 contains problems which use whole numbers.

Level 2 contains problems which use integers (positive and negative whole numbers, including zero).

Level 3 contains problems with fractions.

Level 4 contains problems with fractions, decimals, and percents.

How to Play

Four weights of different values are shown on scale **A**. At the top of the screen is a target total. Determine which three weights add up to the target total.

- Using arrow keys or mouse, select the weight that is **not** needed to reach the target total and mark it by pressing **<Space>**.

Move the weights from scale **A** to another scale (**B** or **C**) using the mouse or all four keyboard arrows.

- Use ↑ to lift the top weight, then → and ↓ to place it on another scale.
- Move the weights one at a time, remembering that weights with larger values may **not** be put on top of weights with smaller values.
- When all of the weights are stacked correctly on the B or C scale, press **<Return>**.

When the stack is correct, the score shown will be based on the minimum number of moves possible compared to the actual number of moves you made. The detective appears to direct the weights as they form a horizontal equation at the top of the screen.

If the stack is incorrect, the student is asked to try again.

Help

Access the **Help** menu for on-screen instructions, hints, or to use the calculator. Select **Goal** to see the fewest moves possible for the problem.

If you wish to start the problem again, it may be done without penalty.

- Select **Start Over** from the Activity menu.

Teacher Tips

Weigh the Evidence can be more easily understood if the teacher provides objects for students to manipulate, then gradually provides more abstract experiences to help students learn the concept.

Have students manipulate small blocks (Cuisenaire rods would be perfect) of three different sizes from one stack to another. This will provide an important visual clue about game strategy. (Remember that bigger values may never be placed on top of smaller values.)

Then move to a slightly more abstract type of activity. Have students manipulate three 3 x 5 cards marked with different values.

Later, add a fourth card with a value **not** needed in the total. Students should identify the card that does not belong and exclude it from the final stack.

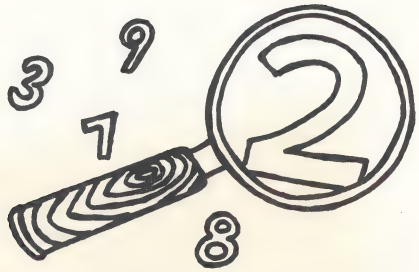
Encourage students to estimate how many moves it will take to complete the new stack. The position of the unneeded weight in the original stack determines the minimum number of moves possible (positioned on top=14, 2nd=13, 3rd=11, bottom=7).

Use different units of measurement for the values on the cards: time, money, length, weight, etc.

Students can work in pairs, each creating a problem for the other to solve. Each watches the other to count moves and make sure that the rules are followed.

Most students can benefit from a review of math facts, fraction, decimal, and percentage equivalents, or finding the lowest common denominator. (These skills are presented for practice in *Math Blaster Plus*.)

ACTIVITY 3: DECIPHER THE CODE



Purpose and Scope

Decipher the Code is a captivating activity which challenges students as they develop higher order thinking skills. Students learn to make inferences and draw conclusions using their knowledge of math facts as they find the numbers and signs in the mystery equation.

The student will learn to:

- hypothesize and test hypotheses
- make inferences
- use alternate strategies
- improve deductive and inductive reasoning skill

Mystery equations at all levels are randomly generated.
Level 1 contains equations with the operation sign and the equal sign provided as initial clues.
Level 2 contains equations with only the equal sign provided as an initial clue.
Level 3 contains equations with no operation sign or other clues given.
Level 4 contains more complex equations (some contain two operators). No initial clues are provided.

How to Play

A row of boxes appears at the bottom of the screen.

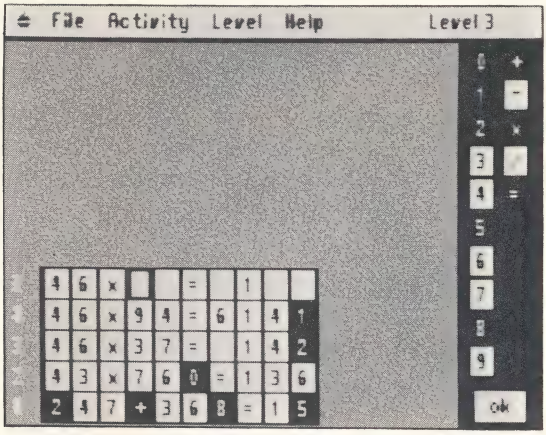
- Enter a number or sign in each box **<Return>**.

A number or sign **in the correct position** will be carried up to the next row.

A number or sign contained in the equation, but **not in that position**, will remain white.

A number or sign that is **not in the equation at all** will turn black.

Use the feedback to help you make logical new guesses to enter in the next row of empty boxes.



Notice the column of numbers at the right of the screen. White boxes contain numbers or signs that have not yet been tried or have not been placed in a correct position. Black boxes contain numbers or signs that should no longer be used as guesses.

When the correct equation is entered, the detective will appear. After fifteen tries, the equation will be supplied.

Help

Access Help to use the calculator, review instructions, or get hints. Hints will help students by giving suggestions based on a student's previous errors. Students may select **Start Over** without penalty during this activity.

Teacher Tips

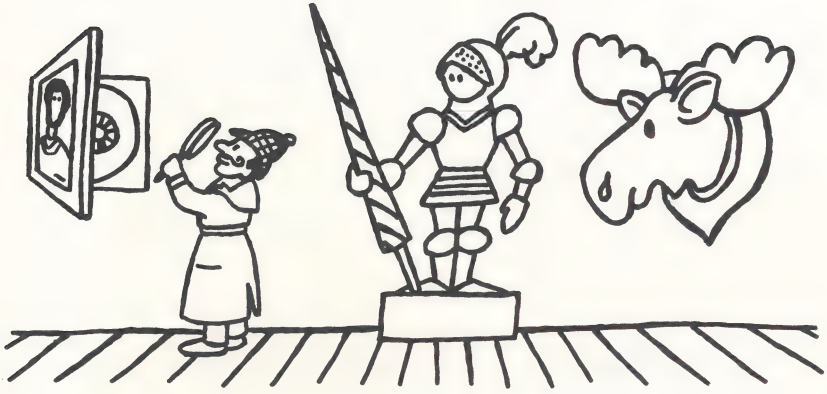
Decipher the Code requires students to draw inferences from numerical information. It may be easier for students to understand this concept if you compare the activity to the word game "Hangman." In Decipher the Code you are looking for missing numbers, whereas in Hangman you are seeking missing letters.

A good lead-up activity to Level 1 is to let students fill in only one missing number in an equation. (Examples: 8 x _ = 64 or _ _ - 54 = 35.) Start with math facts they know, such as the multiplication tables, then move on to equations that require calculation. Discuss using the inverse operation to find a missing number (+ and - are inverse; ÷ and x are inverse). Davidson's *Math Blaster Plus* program provides this type of practice.

Encourage students to make "educated" rather than random guesses. Put some examples on the chalkboard. Show them how to evaluate information they have been given to help them make choices. Some examples:

- A first guess that uses as many different digits as possible will serve to quickly point out numbers that are not in the equation at all.
- Compare the number of spaces on either side of the equal sign. _ _ _ _ _ = _ _ _ _
  Remember that one space on the left is used by the operation sign. If there is a four digit answer, it's probably not division, addition or subtraction. A better guess would be multiplication.
- Look at the place value of the known digits in the problem. _ 4 + _ 8 = _ _ _
  You can tell that the digit in the ones place in the answer must be a 2. You also can tell that since the problem has a 3 digit answer, the two missing digits in the problem need to add up to more than nine. (Don't forget about carrying a 1 to the tens column.)

ACTIVITY 4: SEARCH FOR CLUES



Purpose and Scope

Search for Clues is a visually appealing activity in which students try to find a mystery number by searching for clues in a room full of objects and characters. Interpreting the clues challenges students to learn a variety of ways to describe and define a number.

Students will apply math vocabulary and learn to:

- organize information
- make inferences and draw conclusions
- account for all the logical possibilities
- develop deductive and inductive reasoning skills

At all levels, mystery numbers are randomly generated.
Level 1 mystery numbers are whole numbers (1 - 50).
Level 2 contains whole numbers (1 - 100); clues may contain an equation with addition or subtraction.
Level 3 contains whole numbers (1 - 100); clues may contain an equation with one sign (+, -, x, ÷).
Level 4 contains integers (-100 to100); clues may contain one or two equations with one sign (+, -, x, ÷).

How to Play

A room full of objects and characters will appear.

- Use the mouse or the keyboard arrows and **<Return>** to select an object or person. (To accelerate the pointer, press <Apple> and an arrow key. On MS DOS computers, use <Ctrl> and ← or →, or <Ctrl> and Pg Up or Pg Dn.)

A clue will appear. For example: n is a factor of 15, n is divisible by 3, or n > 36.

- Read the clue; then enter a logical guess.

If the guess **is** logical, but not the correct mystery number, continue to look for more clues.

If the guess is **not** logical, an arrow will point to the conflicting clue and you may try another guess.

Help

In this activity, help is accessed by clicking on buttons within the clue box. Hints, definitions, a list of incorrect previous tries, and the calculator may all be accessed from within the box. Use the mouse to click or **<Tab>** to move from button to button; press **<Space>** to select.

Teacher Tips

Search for Clues is an activity which effectively reinforces many objectives of the math curriculum. It motivates students to apply their knowledge of math facts and terminology as they learn to reason with numbers.

It is helpful to review the math vocabulary and symbols used in this activity, i.e., factor, multiple, integer, digit, <, >, ≠. (Note: in the program, the student can pull down the Help menu and select **Definitions**).

An excellent supplementary activity is to have students choose a mystery number and create their own clues. Another student can find the mystery number from the clues. Create a work sheet like the one below.

? ? Mystery Number ? ?

Created by _____ Answered by _____

n is divisible by ____	n is _____ (odd/even)
n is a multiple of ____	n contains the digit ____
n < ____	n > ____
n ≤ ____ + ____	n ≥ ____ + ____
n ≤ ____ − ____	n ≥ ____ − ____
n ≤ ____ x ____	n ≥ ____ x ____
n ≤ ____ ÷ ____	n ≥ ____ ÷ ____
n ≠ ____	

Possible answers: _____

Direct the class as they fill out a work sheet together. Point out clues that might be redundant (n is even, n is divisible by 2). Also point out that some combinations of clues can allow more than one correct answer.

Play "I'm Thinking of a Number" with the group. Think of a secret number. Students ask questions in clue form and the leader answers "Yes" or "No." (Is the number divisible by 3? Is it greater than 10? Is it even?) Students should be encouraged to take notes, so guesses take all clues into account. The winner gets to be the new leader.

ABOUT THE AUTHORS

Math Blaster Mystery was developed by a team of educators and programmers. The team was directed by Dr. Jan Davidson, former teacher, founder and president of Davidson & Associates, Inc. and Mike Albanese, programming manager.

The *Math Blaster Mystery* team:

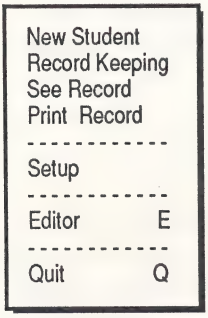
Larene Wade Spitler wrote the Apple and IBM versions in FORTH and assembly languages;
Julie Baumgartner and **Anne Hertz** coordinated the product's design;
Faye Schwartz assisted in the design and testing;
Tim Baumgartner created the data files;
Cathy Johnson wrote and edited the documentation and coordinated the testing of the program;
Tim Nixon and **Carol Carpenter** created the screen graphics.
Kelly McMahon illustrated the manual.

We are grateful to the students at Fleming Jr. High School in Lomita, California; their late principal, Pat Cragin; and their teachers, Tim Desmond, Jim Lanich, Julia Stembridge, and Judy Tikaya, who assisted in testing and evaluating the program.

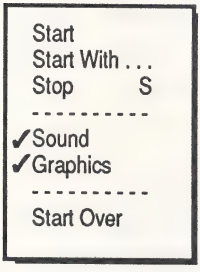
Thanks also to Kay Gore, Ellen Bialo, and Jay Sivens for their professional assistance and educational expertise.

APPENDIX A

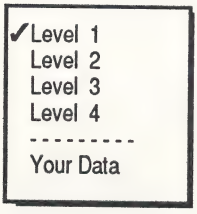
Main Screen Menus



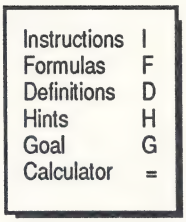
File Menu
New Student - start a new student
Record Keeping - turn on or off
See Record - view a record on screen
Print Record - print student's record
Setup - specify printer, etc. to be used
Editor - create new word problems
Quit - leave *Math Blaster Mystery*



Activity Menu
Start - start an activity
Start With - problem # for Activity 1
Stop - end an activity
Sound - turn sound on or off
Graphics - turn graphics on or off
Start Over - restart problem

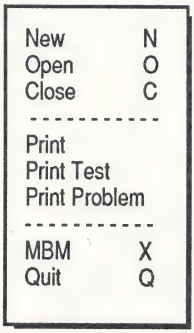


Level Menu
Level 1 difficulty levels
Level 2
Level 3
Level 4
Your Data - custom file (word problems)

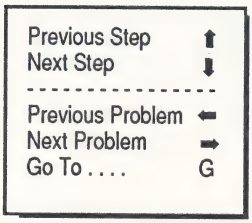


Help Menu
Instructions - directions for play
Formulas - help for word problems
Definitions - help for Activities 1, 4
Hints - help for Activities 2,3,4
Goal - least # of moves possible
Activity 2 only
Calculator - access calculator

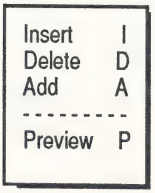
Editor Menus



File Menu
New - create a new data file
Open - open a data file
Close - close existing file
Print - print out a data file
Print Test - word problems and steps
Print Problem - print problems only
MBM - return to the program
Quit - leave program, return to DOS



Move Menu
Previous Step - move back one step
Next Step - move to next step
Previous Problem - move back
Next Problem - move ahead
Go To. . . - find a specific problem #



Edit Menu
Insert - insert an entry into a file
Delete - delete an entry from a file
Add - add a new problem to the file
Preview - view problem with high-lighting and underlining

APPENDIX B

Apple Setup

If you wish to print a Certificate of Excellence, pull down the File menu and select **Setup**. Indicate the following choices. (**<Tab>** between fields.)

Printer category:	A	(A-U)
Interface category:	A	(A-Y)
Line feed:	Y	(Y-N)
Slot number:	1	(1-7)

- Scan the following list to find the category of the printer you are using; enter the appropriate letter.
- Find the category for the interface card your printer uses; enter its letter.
- Choose **Y** (Yes) for Line Feed. Print a sample certificate to see if this choice is correct for your printer. (If there is a blank line between each line of graphics, change the Yes to No.)
- Enter the Slot Number for your printer card (usually slot 1).
- Save these choices to the disk. They may be changed and resaved if necessary.
- Print a sample certificate, if you wish, to check your choices.
- Re-initialize your printer (turn it off and then on again) after printing a graphic certificate.

On the following pages are listed the printers and printer interface cards supported by the Apple version of *Math Blaster Mystery*. The graphic certificate may be printed only if your printer and interface card are among those listed.

Printers

A. Anadex DP-9000/9500 *
B. Anadex DP-9001/9501 *
Datasouth 180
C. Apple Dot Matrix **
D. Apple Scribe
E. Brother M-1009
Epson FX-80
Epson FX-85
Epson JX-80
Epson LX-80
Panasonic KX-P1091/1092
F. Epson MX-70
G. Epson MX-100
Epson MX-80 with Graftrax
HP Thinkjet ***
Panasonic KX-P1090
H. Epson RX-80
Epson LQ-800
I. Apple Imagewriter
Apple Imagewriter II
Epson AP-80
J. Malibu 200
K. Mannesmann Tally 160/180
L. Okidata Microline 82A/83A****
M. Okidata Microline 92/93
Okidata Microline 84
N. C. Itoh Prowriter
C. Itoh Prowriter II
C. Itoh 7500
C. Itoh 8510
NEC PC-8023/8025
O. Smith Corona D100/200/300
P. Blue Chip M120/10
Mannesmann Tally Spirit 80
Q. Star Delta 10/15
Star Gemini 10/15
Star Radix 10/15
R. TRS-80 DMP-105
TRS-80 DMP-400
S. Transtar 315
T. Okidata Microline 192/193
U. Legend 1385
IBM Compatibles

* Option R (2K buffer expansion) required to print graphics.

** Set dip switches as follows: O = Open C = Closed

SW1	SW2
1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8
O O O O O O O O	C O O O O C C O

*** Switch 5 must be **up** to set alternate mode (Epson compatible).

**** Must be equipped with the Okigraph graphics option.

Printer Interface Cards

A. Apple Communications
   SSM-AIO-II Serial
   SSM-ASIO
   Versacard Serial
B. Apple IIc Serial Port
C. Apple Centronics Parallel
   Apple Parallel
   Apricorn Parallel
   Epson APL
   Graphicard
   Microsystems MSE 1022
   Microtek RV-611C
   MPC-AP-80
   MPC-AP-Graph
   Omnigraph
   Printer Pro
   Printerface
   Printmax
   SSM-Appic
   Tymac
   Versacard Parallel
   Wizard-IPI
   Wizard-BPO
D. Apple Serial
E. CCS 7720 Parallel
F. CCS 7728 Parallel
G. Dispatcher
   Dual-Comm Plus
   Franklin Dual Port
   Printermate
H. Dumpling 64
I. Dumpling GX
J. Fingerprint+ Parallel
   Grappler+
K. Grafstar
   Grappler
   Orange
   Spies Niceprint/Super-MX
L. Grappler Serial
   Pretty Print
M. Mountain Comp Parallel
N. Mountain Comp Serial
O. Micro Buffer II
P. Apricorn Serial
   MPC AP-SIO
   MPC Graphwriter
Q. PKASO or PKASO/U
R. Quadram-Apic
S. K-T Parallel
   SSM-AIO-II Parallel
   SSM-APIO
T. Apple Super Serial
   Fingerprint+ Serial
   Microtek SV-622C
   Videx PSIO Serial
U. Videx Uniprint
V. Fingerprint
W. Transtar Pics
X. AppleShare Network (IIe)
Y. Apple Firmware (GS)

APPENDIX C

Special Display Adapters (Hercules, EGA, VGA, MCGA)

If your computer has a display adapter **other than** CGA you should reset the default on the program disk before you run the program, make the disk self-booting, or copy the program to a hard disk.
To set the default, follow the directions below.

- Start the computer using your DOS disk.
- Remove the DOS disk; insert the Program disk.
- At the A>, type **setup**
- From the list on the screen, enter the number that corresponds to the type of display adapter in your computer; press <Enter> to start the program.

IBM Self-booting Instructions

Only the 3 1/2" size disk may be made self-booting.

- Using 2 drives, start the computer with the DOS disk in drive A and the program disk in drive B.
- At the A>, type **sys b:** <Enter>. Follow screen prompts. (For one drive, insert the program disk when prompted for the disk for drive B, and the DOS disk when asked for the disk for drive A.)
- At the A>, type **copy command.com b:** <Enter>.

If you have a custom printer driver for a special printer, you will need to copy it to the disk too. (It must be named **graphics.com** when copied to the MBM disk.)

IBM Hard Disk Installation

Follow these directions to copy the *Math Blaster Mystery* program and data files to your hard disk:

- Start the hard disk (drive C) as usual.
- Put the *Math Blaster Mystery* disk in drive A.
- At the prompt, type **a:** <Enter>. (You must log on to the drive that the Program disk is in. If you put the disk in drive B, type **b:**)
- At the prompt, type **hdinstal c:\mbm** <Enter>. You may install to a hard drive of another name or to a subdirectory within an existing directory. For example: **hdinstal d:\educ\mbm** Be sure to type the complete pathname.

Note: If the installation terminates before completion, make sure that: the program disk is not write protected; there is adequate space for the program on your hard disk; you have typed in the command completely.

To remove the program from your hard disk, follow the instructions above, but substitute **uninstal** for **hdinstal**.

You may create subdirectories within **\mbm** in which to store custom data or records.

- At the C>, type **md c:\mbm\newdata**
  Enter the complete data pathname in the Setup when you use your new files with the program.
- At the C>, type **md c:\mbm\records**
  Enter the complete pathname for records in the File menu's Setup after you start the program.

To run *Math Blaster Mystery* from your hard disk:

- Start your computer as you normally would, from the hard disk.
- At the C>, type **cd mbm** <Enter>. (This will access the mbm subdirectory from the directory to which you installed.)
- At the C>, type **mbm** <Enter> to start the program.

APPENDIX D

Trouble Shooting Tips

Common IBM, Tandy, and Compatible Owner Problems

Symptom	Solution
White arrows moving across screen (Tandy 1000)	You must run the program using DOS version 2.11.24 or 2.11.26.
After a command is entered, screen goes blank OR you are getting only 2 or 4 colors instead of 16.	The program doesn't know what type of display adapter your computer has (CGA, EGA, VGA, MCGA, or Hercules). Go back to the A> and type **setup** to reset the default properly. See pg. 36)

Common Apple II Owner Problems

Symptom	Solution
Scrampled graphics (Apple IIe only)	You must have an extended 80 column graphics card. If you have the card and are still experiencing this problem: • Open the computer and find the serial number on the mother board. • If the serial number ends with "A", you must update your ROM version or return the program to place of purchase. • If the serial number ends with "B", find the extended 80-column card. On the card's bottom left corner are 2 prongs. There should be a jumper that slips over the prongs. If it is missing, get one from an Apple dealer; cover the prongs.

Program runs too fast (IIc+ only)	Hold down **<Esc>** as soon as you turn the computer on (while program is booting).
Blurred letters	This "rainbow" effect sometimes happens with RGB monitors.
Unable to load ProDOS	The disk is defective or is damaged. Return the disk for replacement. See page 2.

If your question has not been answered by the suggestions above, please feel free to call Customer Support between 7:30AM and 5PM, Monday through Friday (800) 556-6141 (outside CA) or (213) 534-2250 (in CA)

When calling Customer Support, please have the following information ready:

Apple

- type of computer (make and model)
- type of printer
- (IIe only) extended 80 column card?

IBM/Tandy 1000/Compatibles

- type of computer (make and model)
- type of printer
- type of graphics card
- DOS version

NOTES

NOTES

Here's What People Are Saying About Davidson's Award-Winning Software

Math Blaster Plus!™ (Ages 5 - 12)
"The program is so magnetic that [children] learn an abundance of math facts, improve their math skills, and enjoy themselves in the process."

Compute Magazine

Reading and Me™ (Ages 4 - 7)
"The choice of three difficulty levels, the onscreen rewards and printed award, and the ability to use the keyboard or a mouse, make this program a good selection for very young users."

Booklist

Word Attack Plus!™ (Ages 9 - adult)
"Word Attack Plus is an ideal program for the home or the classroom."

The Wright Selection

Speed Reader II™ (Ages 14 - adult)
"This program is a well-designed tool for a specific purpose. It is friendly to both student and teacher, and it teaches effectively; you can watch yourself getting better, which is a great motivation to keep practicing."

Softalk

Spell It!™ (Ages 9 - adult)
"Spell It is a highly motivating vocabulary and spelling program that makes good use of the computer's ability to individualize instruction."

Electronic Learning Magazine

Alge-Blaster™ (Ages 14 - adult)
"Alge-Blaster has excellent tutorials, practice activities, and a quiz game to challenge students. The program comes with exceptionally clear instructions on-screen and in the manual, and excellent documentation."

Electronic Learning Magazine

Davidson's Award-Winning Software Line-Up

Math Blaster Plus!™
- Parents Choice Award/*Parents Choice Foundation*
- Highly Recommended/*Media & Methods Awards Portfolio*
- Rated: Excellent/*Florida Center for Instructional Computing*
- Highly Recommended/*Apple IIGS Buyer's Guide*
- Certified Gold Award (Over 100,000 sold)/*Software Publishers Assoc.*

Word Attack Plus!™
- Rated: Excellent/*Compute Magazine*
- Highly Recommended/*The Wright Selection*

Read 'N Roll™
- Rated: Excellent/*Florida Center for Instructional Computing*
- Highly Recommended/*Media & Methods Awards Portfolio*

Math and Me™
- Rated: Excellent/*Florida Center for Instructional Computing*
- Rating:A/*Software Reports: A Guide to Educational Software*
- Highly Recommended/*Survey of Early Childhood Software*
- Highly Recommended/*A+ Magazine*
- Software Excellence/*High Scope Resource*

Reading and Me™
- Rated: Excellent/*Teaching and Computers Magazine*
- Highly Recommended/*InCider Magazine*
- Rating:Very Good/*Home Office Computing Magazine*

Spell It!™
- Highly Recommended/*Media & Methods Awards Portfolio*
- Critics' Choice Award/*Family Computing*
- Grade:A/*Software Reports: A Guide to Educational Software*

Alge-Blaster™
- Highly Recommended/*Curriculum Product Review*
- Highly Recommended/*Electronic Learning Magazine*
- Grade:A/*Software Reports: A Guide to Educational Software*
- Highly Recommended/*Compute's Gazette*
- Certified Silver Award (over 50,000 sold)/*Software Publishers Assoc.*